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Effect of RF plasma treatment on the nonlinear refractive index and susceptibility of PVC film DAVOUD DORRANIAN, YASAMAN GOLIAN, FARIDEH SHAHBAZ TAHMASEBI, MORVARID RASHIDIAN, Plasma Physics Research Center, Science and Research Branch, Islamic Azad University, Tehran, Iran — Effect of argon plasma treatment on the nonlinear optical properties of red lake doped commercial PVC film is studied employing different optical techniques. PVC films were exposed to low pressure plasma from 5 to 15 minutes. Experiments were performed using the second harmonic of a continuous Nd-Yag laser beam at 532 nm wavelength and 20 mW power. The optical bleaching behavior of samples was investigated by measurement of transmission through them. For all pristine and plasma treated samples optical bleaching started at laser beam power of 3.5 mW. The nonlinear refractive index and two photons absorption coefficient of plasma treated samples were measured using Z-scan method. Experimental results show that real and imaginary parts of nonlinear susceptibility decrease with increasing the time of treatment.

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